Water Resources Planning Committee
Annual Report 2009
to the
Land and Water Resources Council

and
Water Use Report 2008

January 2010
Robert G. Marvinney, State Geologist
Maine Geological Survey

Introduction

The Maine Water Resources Planning Committee (WRPC) was established by the 123rd Legislature, 1st Session in May 2007. This step came after many years of referenda on water issues, a 1½ -year-long stakeholder process to review regulations governing groundwater withdrawals, and several controversial groundwater bills in the 1st Session. The establishment and responsibilities of this Committee were part of comprehensive legislative actions to address specific water issues in Maine negotiated with members of the Legislature's Natural Resources Committee and a stakeholder group.

The WRPC draws its membership from state agency groundwater professionals, water utilities, agricultural water users, the bottled water industry, other commercial water users, private well drillers, and a water advocacy organization. (See Appendix A for membership list.)

The overarching charge to the WRPC is to plan for sustainable use of water resources, through three phases of work. The first phase of this effort is to gather and otherwise improve water resource data and to use these data in an analysis of "watersheds at-risk." Prior to establishment of the WRPC, the Maine Geological Survey conducted a preliminary analysis of "watersheds at-risk" using available data as part of a comprehensive review of groundwater withdrawal regulations. The map produced through this process (Figure 1) identifies a number of watersheds in which cumulative withdrawals in combination with in-stream flow requirements might be a large percentage of available water resources. Improving water information in a select few of these watersheds is the focus of WRPC work during 2008.

The second phase of work for the WRPC will be to convene planning groups in watersheds where additional data gathering and analysis indicate that cumulative water use, including demands for in-stream flow, approach unsustainable conditions.

The WRPC hopes that the third phase of work will not be necessary, involving a return to the Legislature with recommendations to address oversubscribed watersheds where the planning efforts of the second phase have failed.

The Legislature provided no additional resources for this new work. The Maine Geological Survey (MGS) has redirected 1½ Hydrogeologists to this effort. Adequate funding has been secured from the Drinking Water Program in cooperation with the water utilities, the Maine Department of Environmental Protection, and from Poland Spring for the field investigations necessary to characterize groundwater in select watersheds. Funding is currently secured for two years only.

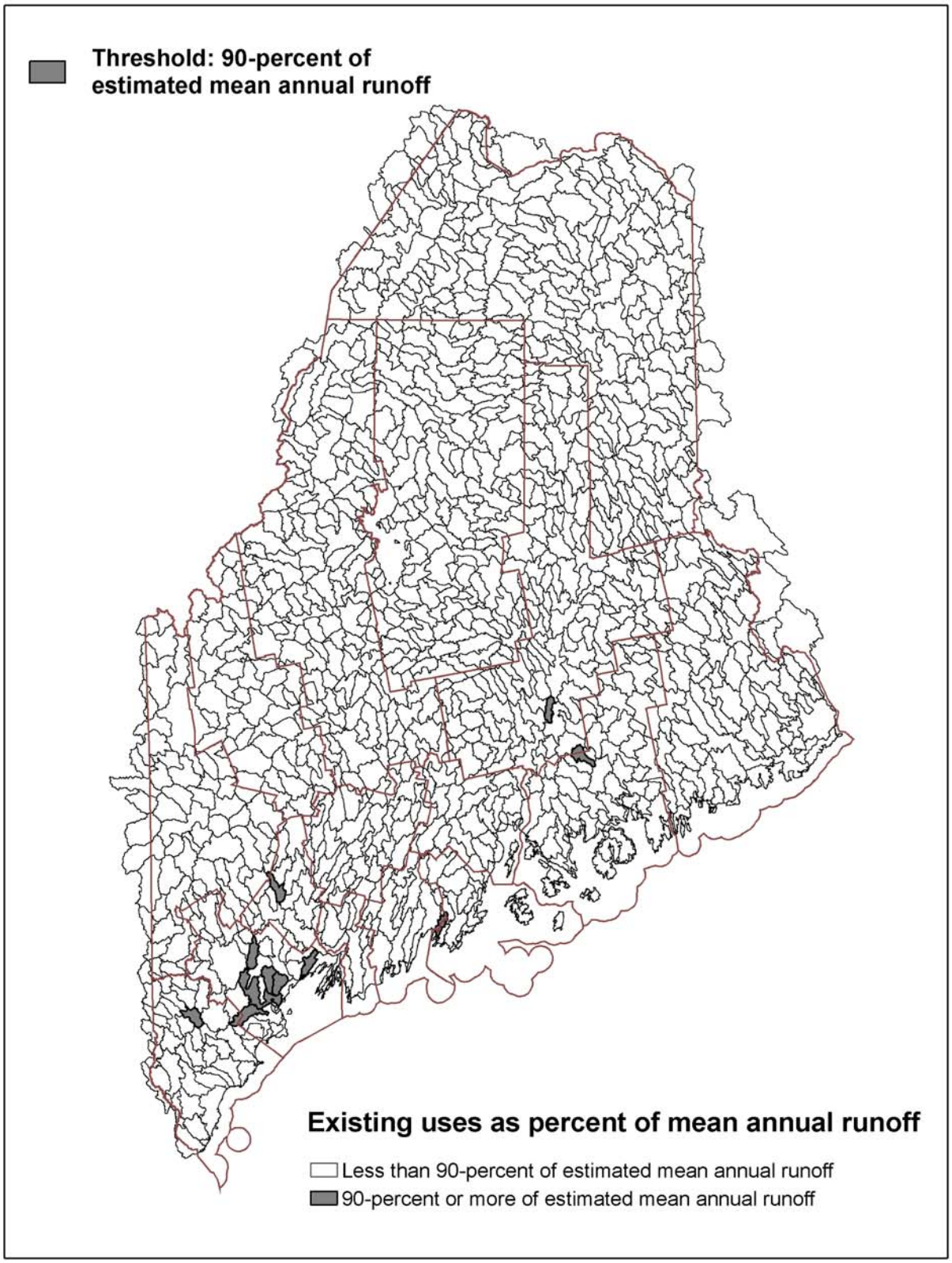

Figure 1. Watershed at-risk analysis conducted in 2006.

Additional Responsibilities

The 124th Legislature passed Public Law 2009, chapter 132, which directed the Water Resources Planning Committee, of the Land and Water Resources Council, in coordination with the Office of the Attorney General and the Citizen Trade Policy Commission, to conduct an examination of the potential legal impacts of international trade agreements on the State's ability to manage its ground water resources, including, but not limited to, the potential consequences of permitting foreign companies to extract ground water. The examination was to include a review and assessment of the following subjects as they relate to or impact international trade agreement issues and the State's regulation of its ground water:

1. Property rights related to the ownership of ground water.
2. The various common law doctrines relating to the use of ground water, including the absolute dominion rule and the reasonable use rule.
3. Natural resources other than ground water.

This review effort was completed in December 2009 and is fully reviewed in a separate report to the Joint Standing Committee on Natural Resources.

2008-2009 activities

This report covers the period November 2008 through December 2009

Committee meetings

The WRPC met on three occasions as a committee from November 2008 to June 2009. To carry out the additional responsibilities of Chapter 132, the WRPC held five joint meetings with the Citizen Trade Policy Commission (CTPC) from July through December 2009. The WRPC and the CTPC also held a public hearing on the issue of international trade and ground water regulations in October 2009. Brief summaries of each meeting are provided here.

November 14, 2008: The WRPC committee heard from the Kennebunk-Kennebunkport-Wells Water District regarding the need for better stream flow information in their watershed. After discussion, the WRPC agreed to use some of the funds provided to the MGS for WRPC activities to install a permanent stream gage within the KKWWD watershed. KKWWD agreed to fund the annual maintenance costs for this gage.

The WRPC briefly discussed the potential for ground water-related bills in the upcoming 1st regular session of the 124th Legislature.

The Maine Geological Survey reviewed our current activities in the Freeport watershed.

March 16, 2009: This meeting was held in Sanford in the evening and was an open public forum attended by about 20 individuals. Members of the WRPC provided an overview of Maine's ground water resources, and a review of regulations that govern ground water withdrawals. The panel of WRPC then fielded questions, mostly focused on bottled water concerns, from the public.

June 16, 2009: The WRPC first reviewed progress on the stream gage on Branch Brook in the KKWWD watershed, which was installed by staff from the U.S. Geological Survey early in 2009. We reviewed progress on investigations in the Freeport watersheds, specifically discussing stream flow measurement sites and an agreement with the U.S. Geological Survey to participate in the study through ground water modeling. We used some WRPC funds to the

MGS to contract with the USGS for this effort, and the USGS is contributing matching funds to augment the resources. We also reviewed the likely charge from the Legislature to conduct a study of the potential impact of international trade agreements on Maine's ability to regulate groundwater withdrawals.

Joint meetings with the Citizen Trade Policy Commission

July 24, 2009: This was an organizational meeting where the CTPC and the WRPC considered the questions that should be the focus of our investigations/discussions, an outline of the review process, and preliminary planning for a public hearing. The CTPC was able to engage Mr. William Waren of the Forum on Democracy & Trade to develop a report on international trade agreements and ground water regulations specific to Maine.

September 11, 2009: At this meeting, the CTPC and WRPC heard several presentations.

- Background on Maine's ground water resources Carol White, C.A. White Associates.
- Overview of Maine's regulation of ground water withdrawals, Robert Marvinney, Maine Geological Survey.
- Background on international trade agreements given by Sarah Bigney, Maine Fair Trade Campaign.
- Legal review of Maine's ground water regulation and ground water ownership, Paul Gauvreau and Peggy Bensinger, Office of the Attorney General.
- Preliminary report on water policy and international trade agreements, William Waren, Forum on Democracy & Trade.

October 30, 2009: Mr. Waren presented an overview of his revised report (discussed below).

November 20, 2009: The CTPC and the WRPC discussed preliminary actions to recommend to the Joint Standing Committee on Natural Resources in January.

December 11, 2009: The CTPC and WRPC discussed and approved revised recommendations.

Public hearing. The CTPC and WRPC held a public hearing on October 15, 2009 at the State House for the purpose of receiving public input to the discussion on the potential impacts of international trade agreements on the State's ability to regulate ground water withdrawals. The CTPC and WRPC announced the date and time of the hearing well in advance via press release and information on the CTPC website. Various interest groups also posted the announcement for this hearing on their websites. About thirty people attended the hearing and twenty-one people spoke. Several groups were represented at the hearing, including Protect our Water and Wildlife Resources, Defending Water for Life, and Save Our Water. Economic and commercial interests were also represented at the hearing.

Investigations

The Maine Geological Survey continued water resource investigations in the Freeport watersheds (see Figure 2) that host the water supply wells for the Freeport Division of Aqua Maine (FDAM). Aqua Maine, Inc., a subsidiary of Aqua America, Inc., is a public utility that owns or manages 15 water systems in Maine. FDAM's primary source wells are in a large sand and gravel aquifer, first mapped by the Maine Geological Survey in the 1980s. Daniel Locke, MGS Hydrogeologist, is conducting and managing the data collection efforts. Primary tasks during 2009:

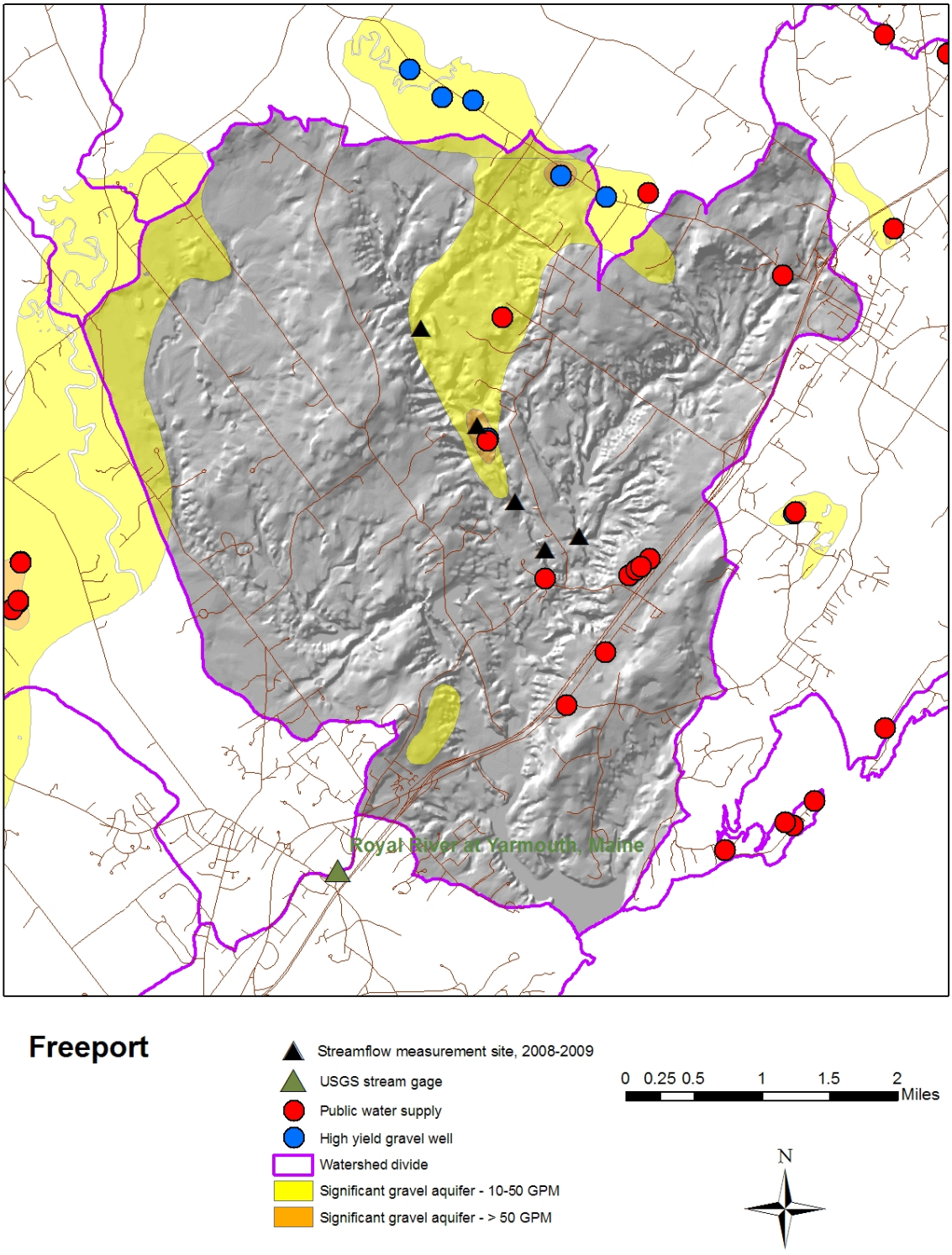

Figure 2. Freeport watersheds (shaded relief) and important ground water wells. Mapped significant sand and gravel aquifers are shown in yellow and orange. Discharge measurement sites indicated by black triangles.

1) Discharge measurements. A meaningful water budget for a watershed requires accurate information on cumulative water uses and stream flow. Through the Water-Use Reporting Program and other sources, we have good information on water use. Since there are no stream gages within the watershed, Mr. Locke worked with hydrologists from the USGS to identify discharge measurement sites on Harvey Brook and Merrill Brook within the watershed. From May through October 2009, Mr. Locke made weekly stream flow measurements at multiple sites on each brook. Figure 3 is an example of the output from a program that computes discharge from a set of measurements for one location on one date.

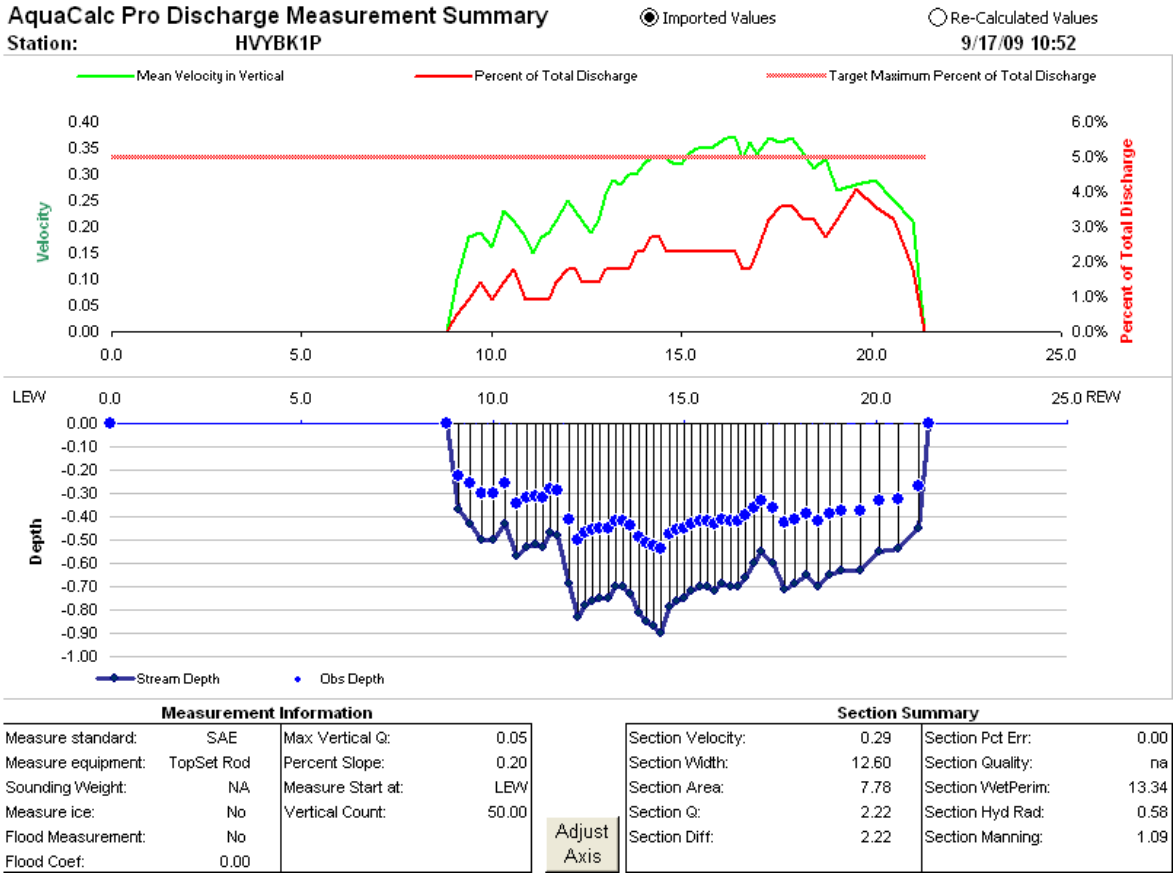

Figure 3. Discharge measurement for Harvey Brook on September 17, 2009. Discharge (Q) at this location is 2.22 cubic feet per second based on 50 individual flow measurements.

2) Cooperative studies: The Maine Geological Survey established a cooperative program with the USGS Maine Water Science Center for ground water modeling in the Freeport watersheds. The USGS is contributing matching funds to this effort, which will be completed in 2010. The tasks for this program are:
    a. Fully account for all water uses and withdrawals in the Freeport watersheds.
    b. Develop a seasonal water budget for the Freeport watersheds (primarily the Merrill Brook and Harvey Brook watersheds), and evaluate the total water use and withdrawals compared to in-stream flow requirements for each seasonal time period, including an analysis of streamflow depletion from aquifer withdrawals.

c. Evaluate streamflow depletion and in-stream flow requirements for potential future withdrawal scenarios.
d. Develop a generic methodology for the evaluation of withdrawals on water resources availability in other watersheds in Maine, to be further evaluated and refined in future studies.

3) Borehole studies: Late in 2009, the MGS contracted with East Coast Exploration for two boreholes in the watershed. This work will be conducted in the most frigid winter conditions of 2010 to look at aquifer characteristics and water table elevations in key areas of the watershed. This work will be important to further refining ground water divides and the physical characteristics of the aquifer medium.

Water Withdrawal in Maine - 2008

Introduction

This is the sixth annual report of Maine's Water Withdrawal Reporting Program, which is found at Title 38 MRSA, §§ 470-A through 470-H. This program requires water users who withdraw quantities in excess of the thresholds contained in the statute to provide information about their annual water withdrawals from public water resources. Public Law 2008, Chapter 619 reassigned this reporting duty to the Water Resources Planning Committee.

Water Withdrawal Data

2008 Maine Water Use Totals by Source (gallons):			
	Total - gallons	**Groundwater**	**Surface Water**
Public Water Supplies	31,000,432,858	9,175,475,892	21,824,956,966
Paper Mills	67,532,676,800		67,532,676,800
Agriculture	1,380,370,796	1,068,959,144	311,411,652
Snowmaking	660,782,583	108,715,369	552,067,214
Bottled Water	701,645,469	701,645,469	
Total	**101,275,908,505**	**11,054,795,873**	**90,221,112,632**

Reported Water Withdrawals by Type - 2003 - 2008						
Type of Use	**Withdrawals Reported (millions of gallons)**					
	2003	**2004**	**2005**	**2006**	**2007**	**2008**
Water Utilities	33,800	34,400	33,500	33,600	29,355	31065
Paper Mills	70,000	66,000	63,000	57,900	64,919	67,533
Agriculture	861	719	622	514	1,691	1,380
Snowmaking	590	559	606	863	537	661
Bottled Water	365	448	440	699	742	702

Public Water Supplies

There are approximately 2,200 Public Water Systems (PWS) in Maine, and of these 400 are community public water systems with 25 or more users. Data for these systems, including

location, source and population served, is maintained in a GIS database by the Department of Health & Human Services, Center for Disease Control and Prevention, Division of Environmental Health as part of their Drinking Water Program.

Production/consumption data for many of the larger water utilities comes from an existing reporting program to the Public Utilities Commission (PUC). The water utilities report to the PUC is on an annual (Jan. - Dec.) basis, with data due by April of the following year. The production/withdrawal data is broken down into monthly segments, and is also further divided by source -- either ground-water or surface water. For calendar year 2007, there were 152 large water utilities and of those 115 had reported to the PUC. This is up from the 87 who had reported prior to last year's report. Of those reporting, annual production for 2007 was 31.1 billion gallons, for an average of 2.6 billion gallons per month, or 85.2 million gallons per day. Of the total water use reported, 74 % (21.7 billion gals.) was obtained from surface water sources, and 26 % (8.1 billion gals.) was obtained from groundwater sources. There are 43 community systems that use surface water. These systems serve large population centers and therefore use the largest quantities of water. The remaining community systems, and nearly all the smaller systems rely primarily on groundwater sources for their supply.

Bottled Water

There were 30 proposed or operational bottled water facilities in Maine in 2008. Eighteen (18) were bottled water plants and twelve (12) were bulk loading facilities. Of the total 30 operational facilities, 25 actually produced bottled water during 2008. The 5 non-reporting facilities either did not sell bottled water during 2008, or were under construction. Total water use for 2008 was 701 million gallons, or an average of 58 million gallons per month. This represents an approximate 5.5 % decrease from 2007. All (100 %) of the water produced by the bottled water plants and bulk loading facilities was derived from groundwater sources.

Commercial and Industrial Use

Maine's pulp and paper manufacturers report their waste water discharges to the DEP and the volume of withdrawal can be calculated from the wastewater discharge volume. Analysis of wastewater discharge volumes from twelve (12) paper mills indicates that they used approximately 67.5 billion gallons of water in 2008. This is up from approximately 64.9 billion gallons in 2007, which is attributed to fewer mill shut-downs during the reporting period. Most of this water is discharged back to the rivers after use and treatment. All the pulp and paper mills lie on Maine's larger rivers, and get 100 % of their water from these surface water sources.

Ski Areas

Of the total 18 Maine ski areas and snow tube parks, 16 had snowmaking capabilities during 2008. These 16 ski areas derive their water supplies from multiple sources: ponds, wells, streams, and rivers. Data is collected on both an annual (Jan. - Dec.) and ski season (Nov. - Mar.) basis. Of the 5 ski areas reporting, a total volume of 661 million gallons of water was used for snowmaking for the calendar year 2008. This total includes an estimated average for one of the

larger ski areas who has not yet reported there water use data. The breakdown of sources for snowmaking water use is 552 million gallons
(84 %) from surface water and 109 million gallons (16 %) from groundwater.

Agricultural Water Use

2008 Agricultural Water Use Reported by county (millions of gallons)						
County	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Washington	581,965,980	549,439,022	558,124,014	458,421,704	1,407,695,139	1,357,462,108
Kennebec	27,760,122	105,136,500			11,165,000	
York	77,547,100	48,455,600		32,356,000	557,894	
Aroostook	69,615,943	8,693,100	37,542,431	10,485,516	162,346,826	21,162,688
Oxford	7,554,094	4,800,000	16,788,000			
Cumberland	49,486,200	2,137,200		5,602,000		
Franklin	377,730	683,760	584,410		327,700	
Penobscot	23,004,000				105,921,061	
Androscoggin	14,502,796		8,848,000	7,614,000	3,546,000	1,746,000
Lincoln	8,116,000					
Sagadahoc	462,500				360,000	
Waldo	445,350					
Somerset	251,000					
Hancock	128,000					
Total	**861,216,815**	**719,345,182**	**621,886,855**	**514,479,220**	**1,691,919,620**	**1,380,370,796**

The Maine Department of Agriculture continues to collect information from farmers regarding water use for irrigation. Farmers in 2008 reported a very wet season in general, therefore numbers of farmers reporting, and reported use is down compared to 2007. The majority of agriculture's water use occurred in Washington County, primarily by the blueberry industry. The breakdown of sources for agriculture water use is 311 million gallons (23 %) from surface water and 1,069 million gallons (77 %) from groundwater.

2008 Maine Water Use Data by County

2008 Water Use Data by County - Only for those reporting (gallons)			
County	**Total gallons**	**Groundwater - GW**	**Surface Water - SW**
Androscoggin	3,578,785,972	647,033,074	2,931,752,898
Aroostook	4,718,284,131	1,031,223,996	3,687,060,135
Cumberland	11,379,631,892	1,397,175,892	9,982,456,000
Franklin	25,631,621,781	445,196,077	25,186,425,704
Hancock	4,992,373,478	264,592,300	4,727,781,178
Kennebec	2,460,844,185	1,098,983,000	1,361,861,185
Knox	46,351,800	12,980,800	33,371,000
Lincoln	283,047,000	21,447,000	261,600,000
Oxford	12,191,872,547	1,217,335,267	10,974,537,280
Penobscot	10,660,877,817	1,157,124,017	9,503,753,800
Piscataquis	230,098,000	75,912,000	154,186,000
Sagadahoc	476,955,000	72,945,000	404,010,000
Somerset	9,349,804,926	166,683,926	9,183,121,000
Waldo	362,299,900	362,299,900	
Washington	9,154,843,108	1,510,799,656	7,644,043,452
York	5,758,216,968	1,573,063,968	4,185,153,000
Total	**101,275,908,505**	**11,054,795,873 (11%)**	**90,221,112,632 (89%)**

Appendix A. Water Resources Planning Committee Membership

Public Members

Mr. Jeffrey McNelly
Maine Water Utilities Association
P.O. Box P
Waldoboro, ME 04572
207-832-2263
jmcnelly@mwua.org
Representing water utilities

David Bell
Agricultural Council of Maine
5715 Coburn Hall
Orono, ME 04469
207-581-1475
dkbell@maine.edu
Representing agriculture

Tim Hobbs
Maine Potato Board
744 Main Street
Presque Isle, Maine 04769
(207) 551-2401
hobbs@mainepotatoes.com
Representing agriculture

Mr. Tom Brennan
Nestle Waters North America
123 Preservation Way
Poland Spring, ME 04274
207-998-6350
tbrennan@perriergroup.com
Representing bottled water

Alex Wong
Maine Rural Water Association
P.O. Box 36
Brunswick, ME 04011
awong@mainerwa.org
Representing water utilities

Mr. Barry Sandford, President
Maine Groundwater Association
Pine State Drilling
(207) 654-2771
mail@pinestatedrilling.com
Representing use of water by private domestic well owners

Mr. James Wilfong
P.O. Box 38
Fryeburg, ME 04037
207-697-2200
James@JamesWilfong.com
Representing environment and conservation

Mr. Greg Sweetser, Executive Director
Ski Maine Association
PO Box 7566
Portland, ME 04112
(207) 761-3774 x100
gsweetser@skimaine.com
Representing use of water by commercial entities

State Agencies

Robert Marvinney
Maine Geological Survey

John Harker
Department of Agriculture

Andrew Fisk
Department of Environmental Protection

John Hopeck
Department of Environmental Protection

Andrews Tolman
Maine Drinking Water Program

Marcia Spencer-Famous
Maine Land Use Regulation Commission

Steve Timpano
Department of Inland Fisheries and Wildlife

Elizabeth Hertz
Maine State Planning Office